Airspace Optimization

Mr. Ernest Snyder
Regional Officer, Air Traffic Management
ICAO NACC Regional Office

P/02 - Agenda Item 5

NACC/WG/RAP/2 Meeting, 28 to 31 March 2023

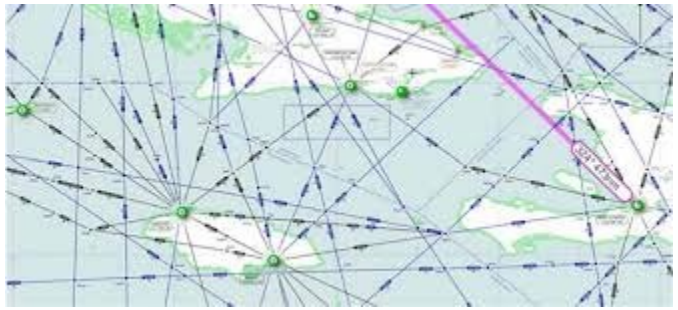
Optimization

- Began with “what we have now, no investment”
- If you can’t support what was requested, “What can you support?”
- Collaboration, we are all involved

Airspace Optimization CAR Region

North American, Central American and Caribbean Working Group (NACC/WG)
Air Space Optimization Task Force

- Working Collaboratively
- Two Pronged Attack
- Moving to Free Route Airspace
- Results



SAFETY | **EFFICIENCY** | **ENVIRONMENTALLY - FRIENDLY**

Airspace Optimization CAR Region

North American, Central American and Caribbean Working Group (NACC/WG)
Air space Optimization Task Force

- States
- CADENA
- IATA
- ICAO

Working Collaboratively - CIIFRA

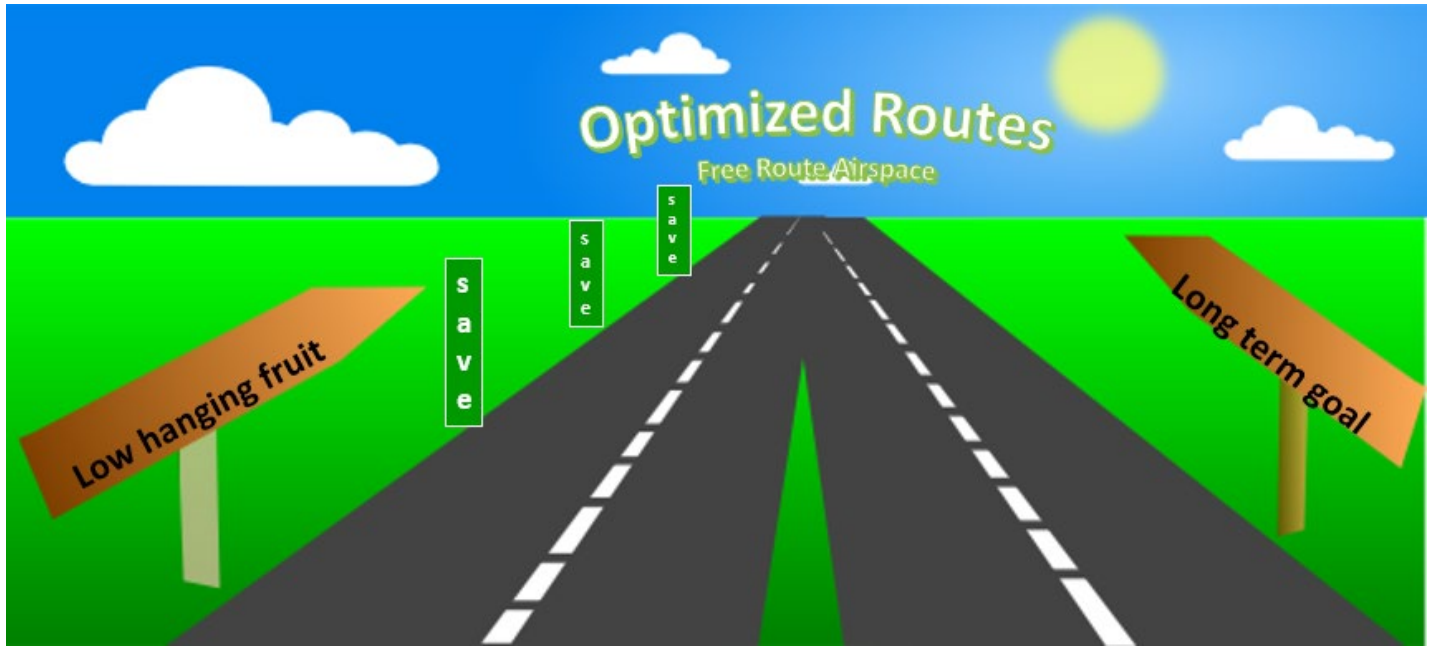
CADENA IATA ICAO Free Route Airspace

Airspace Optimization CAR Region

North American, Central American and Caribbean Working Group (NACC/WG)
Air Space Optimization Task Force

Two Pronged Attack

- End to End route Optimization
- User Preferred Route
- Free Route Airspace



Airspace Optimization CAR Region

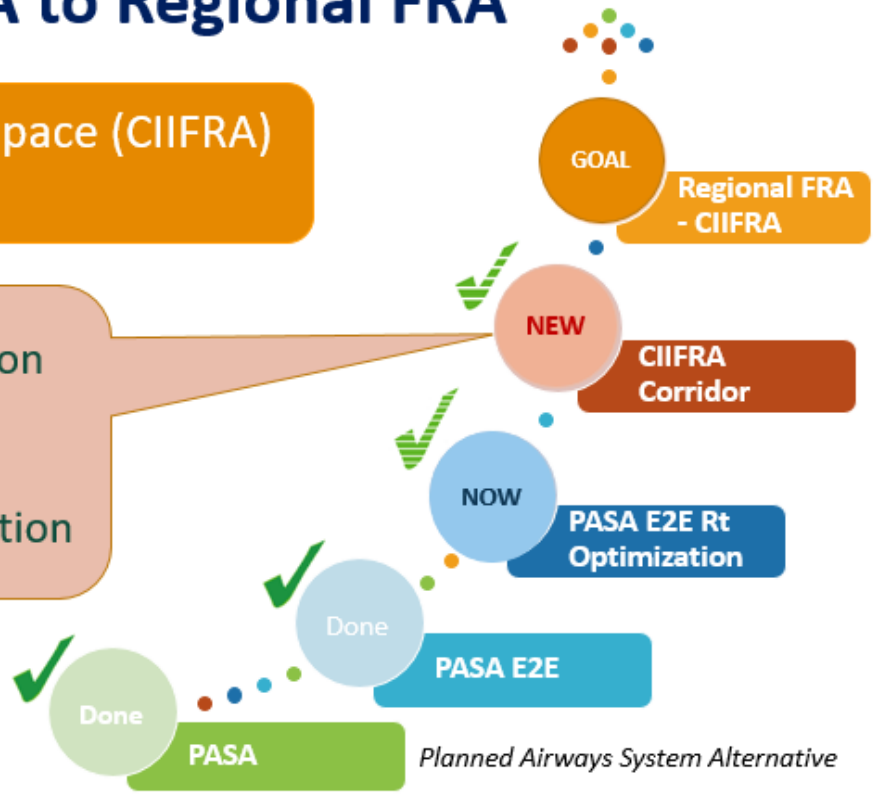
North American, Central American and Caribbean Working Group (NACC/WG)
Air Space Optimization Task Force

Move to Free Route Airspace

Step-by-Step: From PASA to Regional FRA

CANSO IATA ICAO Free Route Airspace (CIIFRA) for Latin America Regional FRA

- Approaches of FRA Implementation
- Formation of Focus Team
- Selection of the 1st CIIFRA Trial
- CIIFRA Trial Plan and Implementation



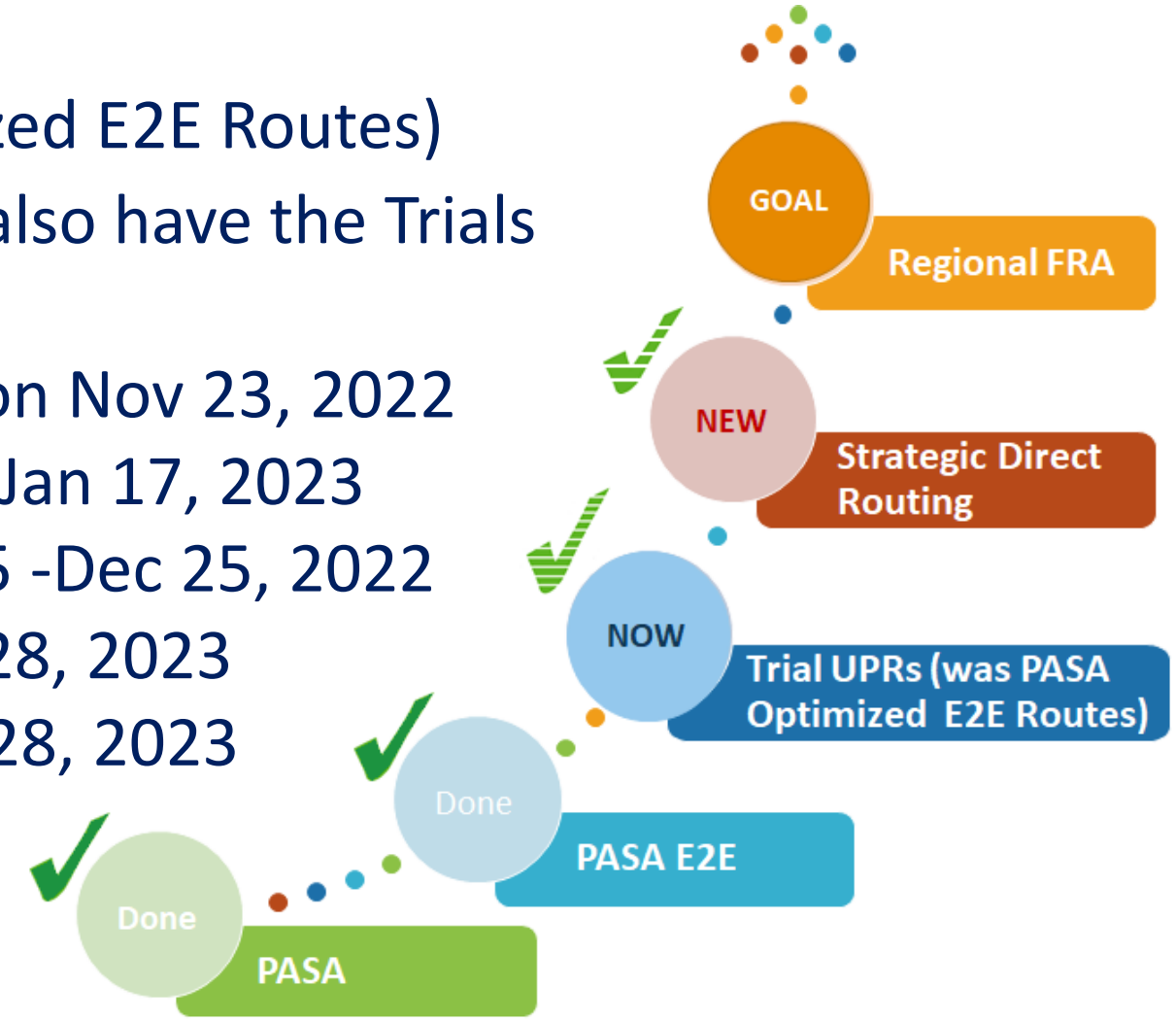
Airspace Optimization CAR Region

Trial UPR (previously PASA Optimized E2E Routes)

In addition to the original 6 Trials, we also have the Trials below:

- MMUN → SAEZ (one-way) – done on Nov 23, 2022
- SKBO → KATL (one way) – done on Jan 17, 2023
- MPTO↔ KLAX (one month) Nov 25 -Dec 25, 2022
- KATL ↔ SCEL – Dec 1, 2022 – Feb 28, 2023
- KATL ↔ SAEZ – Dec 1, 2022 – Feb 28, 2023

DAL conducted couple more KATL-SAEZ Trials to add more op routes



Airspace Optimization CAR Region

North American, Central American and Caribbean Working Group (NACC/WG)
Air space Optimization Task Force

Results Track A

The CANSO-IATA-ICAO Free Route Airspace (CIIFRA)
Trial UPRs Benefit Data
As of: January 12, 2023

	Baseline Flight Plan Route vs Trial UPRs Reported Data Projected to 1-Year Savings
Savings:	
Flight min	19,535 min
Fuel (lb)	3,806,672 lb
CO2 (kg)	6,273,658 kg
Cost ($ USD)	$ 3,260,444

Airspace Optimization CAR Region

North American, Central American and Caribbean Working Group (NACC/WG)
Air Space Optimization Task Force

Results Track B

Estimation of 1-year savings based on 12 days of data obtained from Steps 0, 1, 2, and 3

KATL-SPJC-KATL
DAL151/DAL150

	Baseline vs UPR	
Savings	12 Day	1 Year
Flight min:	116	3,528
Fuel (lb):	12,479	379,570
CO2 (kg):	17,887	544,057
Cost ($):	15,325	466,138

Mexico's SDR Trial – UAL Benefits

Oct 3 - Dec 3, 2022

		Saved				Per Flight			
	No.	Time (min)	Fuel (lb)	CO2 (kg)	Cost ($)	Time (min)	Fuel (lb)	CO2 (kg)	Cost ($)
SBGR-KIAH	20	42.0	13,360	41,416	7,644	2.1	668	2,071	382
SAEZ-KIAH	46	59.0	22,437	69,555	12,390	1.3	488	1,512	269
SBGL-KIAH	28	57.0	10,451	32,398	9,918	2.0	373	1,157	354
SPJC-KIAH	6	6.0	1,547	4,796	1,044	1.0	258	799	174
SCEL-KIAH	41	53.0	12,060	37,386	9,222	1.3	294	912	225
SKBO-KIAH	8	19.0	2,258	7,000	1,843	2.4	282	875	230
SEQM-KIAH	11	26.0	2,889	8,956	2,522	2.4	263	814	229
MGGT-KIAH	3	9.0	969	3,004	1,800	3.0	323	1,001	600
Total	163	**271.0**	**65,971**	**204,510**	**46,383**				
1 Year		**1,626**	**395,826**	**1,227,061**	**278,298**				

NOTE: To calculate cost benefits, equipment types were taken into the consideration.

Mexico's SDR Trial – DAL Benefits

SENEAM SDR Data (DAL - through October 15, 2022)

		Saved				Per Flight			
	No.	Time (min)	Fuel (lb)	CO2 (kg)	Cost ($)	Time (min)	Fuel (lb)	CO2 (kg)	Cost ($)
KLAX-MROC	6	15	3,440	4,931	2,773	2.5	573	822	462
KLAX-MSLP	2	2	299	429	311	1.0	150	214	155
Total	8	**17**	**3,739**	**5,359**	**3,084**				
1 Year		**517**	**113,728**	**163,012**	**93,805**				

NOTE: To calculate cost benefits, equipment types were taken into the consideration.

Mexico's SDR Trial – AMX Benefits

SENEAM SDR Data (AMX - through November 15, 2022)

Oct 16 - Nov 29, 2022		Saved				Per Flight			
	No.	Time (min)	Fuel (kg)	CO2 (kg)	Cost ($)	T (min)	Fuel (kg)	CO2 (kg)	Cost ($)
MMTJ-MMGL	9	34.0	1,891	5,976	4,951	3.8	210	664	550
MMTJ-MMMX	21	26.0	1,009	3,188	3,427	1.2	48	152	163
CYVR-MMMX	14	84.0	3,407	10,766	11,194	6.0	243	769	800
Total	44	**144.0**	**6,307**	**19,930**	**19,572**				
1 Year		1,168	51,157	161,655	158,749				

As of January 2022, the price of Jet A1 was approximately $816 per metric tonne. This equates to about $0.82 per KG.

Data Source (Nov 5, 2022): https://www.flightdeckfriend.com/

NOTE: To calculate cost benefits, equipment types were taken into the consideration.

1 kg = 2.20462 lb

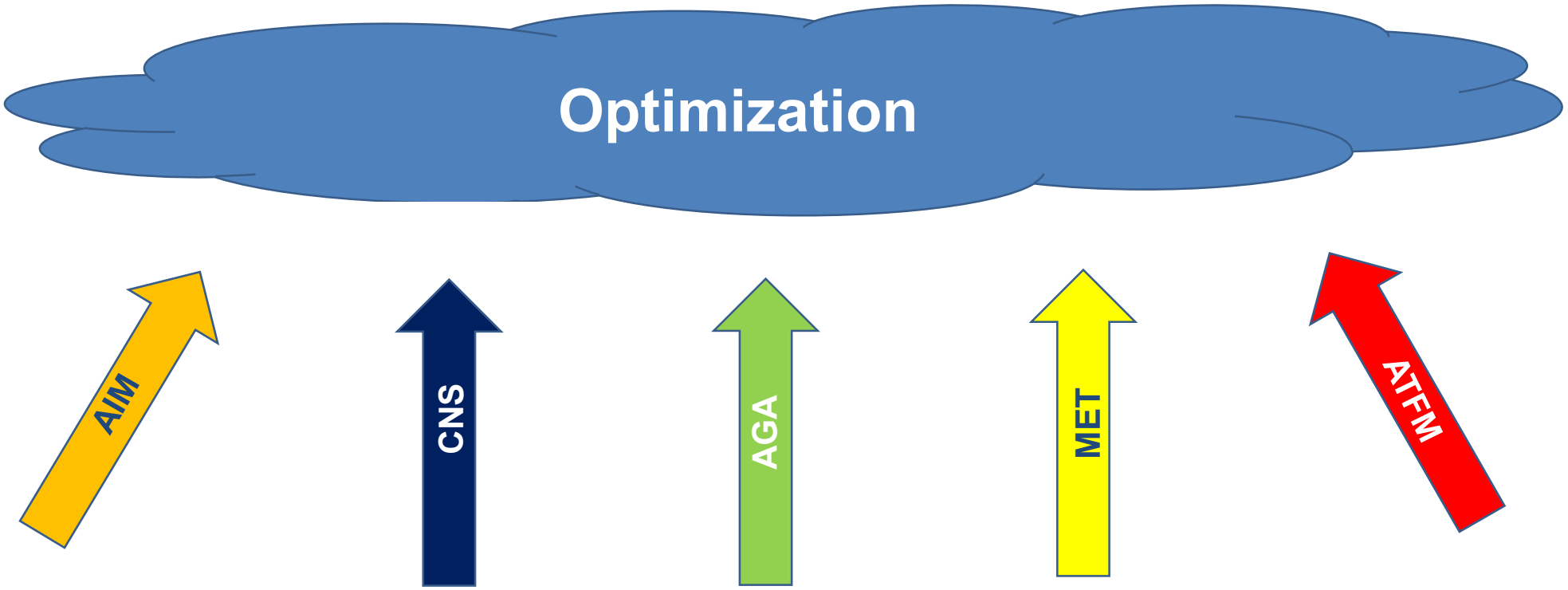
Overall Benefits

	All phases included
Savings:	
Flight min	26,374 min=33 round trips KATL-SPJC
Fuel (lb)	4,808,578 lb
CO2 (kg)	8,369,443 kg= 20,774,678 miles driven by average car*
Cost ($ USD)	$ 4,257,434

* USA EPA

What's Next?

- How do we support optimization?



AIM

- Enhancing AIRAC publishing cycles
- Make publications digital
- Publication of Electronic Flight Procedures
- Cost of AIPs
- eTOD
- Flight Planning REJ (Format) / FF-ICE Update (AIDC-TF)

CNS

- Synchronize and Harmonize Communication & Surveillance
- Surveillance data sharing/ redundancy for surveillance and communications.
- Regional Gap Analysis
- Network communication for ATS
- Explore alternative technologies i.e., Space-based VHF
- Estimates or CPL information for traffic in FRA
- Capability of ATM systems
- Digital ATIS

AGA

- Analysis/inputs for airport planning and design.
  - Airports master planning ATM inputs.
  - Airports Coordinate construction/maintenance projects
  - Airport Airside/Landside balance and harmonization
- High speed taxi/exits.
- Utilizing airports for CDM (ATFM-CDM).
- Collaboration Technical/Operational details
  - Lighting and Ground Aids (Approach)
  - Ongoing Obstacle Analysis
  - PCN Value

MET

- Standardized Weather Reports
  - Volcanic Ash
    - Concentration Charts
    - METAR Ash Report Accuracy and Standardization
    - Airport Contingency Procedures i.e., Ash contamination Assessment/Removal
- Weather forecast and updates given from an aviation perspective
- Space Weather
- Special Weather Report Requirements for Temperature (SPECI)
- Digital ATIS
- Turbulence, Icing reports

ATFM

- Availability of ATFM Tactical Resources
- Common ATFM procedures and terminology (Doc 9971)
- Data Sharing amongst all stakeholders (Agreement & Implementation)
  - LOA’s
- Data Driven Approach
  - Set Measurable Targets (KPIs)
- Real time Airport /Sector Capacity display
- Post event review